

CHAPTER 18

Biospheric Resources and Growth

There are some people who live in a dream world, and there are some who face reality, and then there are those who turn one into the other. Douglas H. Everett

There is no worse screen to block out the Spirit than confidence in our own intelligence. John Calvin

We should ask God to increase our hope when it is small, awaken it when it is dormant, confirm it when it is wavering, strengthen it when it is weak, and raise it up when it is overthrown. John Calvin

Except for the few very wealthy during the Great Depression, everyone made sacrifices during that time. Shoes were re-soled either by purchasing rubber soles and a glue kit for self repair or by taking them to a shoe repair shop. Home vegetable gardens were common, and surplus vegetables were shared with neighbors. Clothing, especially children's garments, was shared within families or passed along. Government programs, such as Work Progress Administration (WPA) and the Civilian Conservation Corps (CCC), worked on projects that benefited society and the environment. Of course, the population of the United States was much smaller in the 1930s.

After World War II, material goods were more abundant and were frequently better and cheaper than the same items were before the war. People adjusted to this new cornucopian era rapidly and began to view it as normal. However, MORE requires resources that are limited on a finite planet, and, at the end of the 20th century, the realization of limits came as an unpleasant surprise. WANTS and not just NEEDS had become an individual's right. This scenario has led to the current situation in which humankind needs both total commitment and a plan/vision for and of the future to merely survive. In addition to a plan/vision, a candid statement is needed of the sacrifices that will be essential to the success of the plan.

Peak Water and Human Wastes

“. . . more and more regions of the world, including the United States, may be reaching the point of 'peak water'" (Gleick 2011). The concept of peak water is difficult to grasp since approximately 71% of Earth's surface is covered by water. However, of all water on the planet, 99% is unsuitable for humans (<http://ga.water.usgs.gov/edu/earthwherewater.html>). Water is truly a renewable resource and moves continuously around the Biosphere. Mother Nature was able to maintain potable water until *Homo sapiens* began discharging wastes that the Biosphere could not assimilate as a resource, even though it had done so for the wastes of 30+ million other species on the planet.

For most of humankind's existence, human feces and urine were returned to the global commons in the same way most other animals eliminated them. After the Agricultural Revolution, many cultures in Asia and Europe disposed of "night soil" by adding it on agricultural lands directly or by mixing it with irrigation water. This process returned human and animal feces to the land, which was more likely to treat the organic matter as a "beneficial input" rather than as a pollutant as do many aquatic systems (Kinnicutt et al. 1919). Ancient Rome's sewer system, the Cloaca Maxima, was built in the 6th century BCE (http://www.livius.org/ro-rz/rome/rome_cloaca.html) and marks an important transition point in the disposal of human wastes. Municipal and industrial waste discharges expelled into moving waters in the early 20th century were comparatively small and widely spaced and sometimes did not exceed the aquatic ecosystem's assimilative capacity for them. Water, especially flowing water, carries wastes (e.g., sewage) away into someone else's backyard.

Placing large amounts of fecal material into the global commons is an irresponsible act unless robust scientific evidence is available on how the receiving ecosystem will respond. Even more irresponsible is adding or allowing persistent, hazardous chemicals (such as endocrine disrupters) to be expelled into the global commons because of the damage they do. The costs of the damage are paid by society as a whole, and little or no part of the cost is paid by

the persons or corporations that reap the financial benefits. In 2011, calls were made by politicians to curtail the authority of the US Environmental Protection Agency to regulate hazardous substances in the environment under the guise of reducing the US national deficit. The increased risk to the general public was not mentioned.

The Oceans

The planet's oceans contain practically all Earth's water. They are a major source of food, but also play a key role in shaping global climate by regulating atmospheric concentrations of carbon dioxide. As applies to this discussion, they represent the largest surface area of the planet and, arguably, the area most in need of both protection and nurturing. As the global food crisis worsens, many nations will be tempted to indulge in unregulated harvesting of marine life from krill to whales. As the climate warms, the temptation may be to utilize ocean iron fertilization (OIF) in some marine systems since increased phytoplankton blooms might temporarily boost the ocean's ability to act as a carbon sink. Planning ahead is mandatory since scientific quality control is essential when attempting to deliberately change global climate

Using Water as a Unifying Theme of Planning to Nurture the Global Commons

An essential beginning point is to accept that neither ignorance nor denial reduces the risks inherent in multiple global crises. Also essential to acknowledge is that the human economy is a subset of the Biosphere, and the human economy will collapse if access (e.g., discharge of pollutants) to the global commons is not restricted by mutually agreed upon coercion. Water is the ultimate renewable resource and has been essential to a wide variety of life forms for billions of years. Substitutes exist for money (e.g., barter), but no substitutes are available for water. Quality is especially important for the very limited freshwater resource. In addition, quality, albeit a different quality, is also important in the vast oceans (e.g., change from mildly alkaline to, at present, mildly acidic). Destroying the global commons in the name of economic growth is mindless and must cease!

The Terrestrial Component of the Global Commons

Increasing population and consumption are placing unprecedented demands on agriculture and natural resources. Today, approximately a billion people are chronically malnourished while our agricultural systems are concurrently degrading land, water, biodiversity and climate on a global scale. To meet the world's future food security and sustainability needs, food production must grow substantially while, at the same time, agriculture's environment footprint must shrink dramatically. . . . tremendous progress could be made by halting agricultural expansion, closing 'yield gaps' on underperforming lands, increasing cropping efficiency, shifting diets and reducing wastes. Together these strategies could double food production while greatly reducing the environmental impacts of agriculture (Foley et al. 2011).

Humans collectively have damaged the global commons so collective action will be required to stop the damage and to rehabilitate as much as possible. Since humanity lives on the terrestrial portion of the global commons, local and regional participation will not require much travel. However, what happens on land has a strong impact on the oceans. For example — carbon dioxide emissions from coal fired power plants enter the atmosphere, which circulates freely over political and ecological boundaries, and pesticides and other hazardous materials discharged into rivers soon reach the ocean currents and are widely circulated in water and the food chain. Even though scathing comments may be voiced from climate change deniers, droughts, wildfires, and permanently hotter summers (Hesterman 2011) should change public opinion — perhaps before runaway climate change occurs.

The cornucopian era is over, as revealed by unmanageable debt at individual and national levels, and has brought unrest and insecurity and loss of confidence in any self regulating free market or policy makers and financial institutions. Worse yet in this time of crisis, the loss of civility has been dramatic with the majority of Americans longing for moderate politics (Klein 2011). Instead of free and open discussions of values, incivility has emerged with people holding megaphones and shouting slogans or worse. Polarization is the new norm, which is not a useful basis for long-range resource management and planning. Most of the conferences are on land, but the oceans are an important component of the Biosphere and must not be neglected. The biosphere is global and all plans must be in a global context.

ECONOMIC GROWTH IS NOT THE SOLUTION — IT IS THE PROBLEM

What type of economy is suitable for a finite planet with finite resources? Not economic growth based on natural resources! Economists often point out that increasing the average economic growth rate in the United States by 1% over the next 20 years would not only result in much higher incomes and more jobs, but would also obviate the need for drastic spending cuts today to reign in the government deficit. However, a 1% growth rate based on natural

resources would require the resource base to double in 70 years (<http://www.ecofuture.org/pop/facts/exponential70.html>).

Conclusions

Humanity must now plan ahead in the 21st century to cope with the consequences of not planning ahead in the 20th century and the first part of the 21st century. These crises are both global and interactive (Cairns 2010), so they must be addressed concurrently, not sequentially. A free and open discourse is essential before any meaningful action can be taken.

The sacrifices humanity must make to eliminate the eight interactive global crises is unprecedented in human history. Worse yet, humankind may have waited too long to take remedial action. "Our planet is approaching a perfect storm of population growth, climate change and peak oil. . . . The planet is not actually sustaining 7 billion people" (Roger Martin of Population Matters as quoted in Harris 2011). "The United Nations will warn this week that the world's population could more than double to 15 billion by the end of this century, putting a catastrophic strain on the planet's resources unless urgent action is taken to curb growth rates, . . ." (Harris 2011).

Humanity has been given warnings about exponential population growth since Thomas Malthus published on population growth in 1798. Despite these warnings, population and economic growth rates have continued to increase exponentially — humankind has ignored all warnings and preferred instead to deny the reality that MORE, BETTER, and CHEAPER are neither sustainable nor feasible on a finite planet. What is needed are realists who recognize that humanity lives on a finite planet with finite resources and that perpetual growth makes no sense and will only produce ever greater catastrophes until the facts are recognized.

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